

MARINE REVIEW.

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No. 4.

Clearing Up the List of New Freighters.

New freight vessels are still leaving the stocks but it is needless to say that no keels are being put down to take their places. The launch of the George J. Gould at Buffalo a few days ago, leaves in course of construction only six or seven freighters in the different lake yards. There are two at F. W. Wheeler & Co's yard, West Bay City, the steel steamer Centurian and a big wooden consort; one wooden steamer, the Carnage, at Davidson's yard, West Bay City, and three wooden vessels at Marine City, with one or possibly two whalebacks at West Superior.

It has been understood since the organization of the Cleveland and Buffalo Transit Company last winter that if the business of the company this season would warrant such a move, a larger and faster passenger and freight steamer than the side-wheeler State of New York would be built to take the place of that boat, which is the smaller of the two owned by the company, on the line between Cleveland and Buffalo. It is now given out unofficially that the company has had a very good business so far this season in both freight and passenger traffic, and there is some talk of the new boat. If the boat is built, the contract will probably go to the Cleveland Ship Building Company, as some of the stock holders in the transportation company are also interested in the ship building company. There is no certainty of the boat being built, however, as there is the disadvantage of the new line having its business cut up somewhat through the competition from the big Northern line steamers that will take a share of the traffic between Cleveland and Buffalo next season, and the present condition of the money market is against building operations of any kind.

The George J. Gould, which has just been put into the water by the Union Dry Dock Company, Buffalo, is a steel steamer built for the Lake Erie Transportation Company, and will run in the Telodo-Buffalo line with the Russell Sage, S. C. Reynolds and J. C. Gault. She has a length of 277 feet over all, with a keel of 259 feet, her moulded depth being 36 feet and her beam 40 feet. She is furnished with a 42-inch bottom, in eight compartments, and six water-tight bulkheads. Her power is furnished by two Scotch boilers from the Lake Erie Boiler Works, each 11½ feet in diameter and twelve feet long, carrying 160 pounds pressure. The engines are Trout triple expansion, with cylinder 18, 30 and 48 inches by 42-inch stroke.

Features of Depression in Freights.

It would be difficult to imagine a more depressed condition of lake freights than the situation with which vessel owners are confronted at the present time. Without a ray of hope in the near future, and in view of the unfortunate tangle of finances in which Ferdinand Schlesinger has been a central figure, discussion in vessel circles has drifted to the question of the several ore agencies standing up to the freight contracts made early in the spring, and which are now profitable assets in the hands of a few fortunate owners, although considered very slim at the time of attaching signatures to them. It is gratifying to note that there is not the slightest lack of confidence on this score, and there are in fact one or two instances where owners, in extraordinary cases, found occasion to cancel a few trips under such contracts and were paid about the full difference in freight. There are also a few cases where shippers have asked vessel

owners to carry in August some ore that should have been brought down in July, but there is little importance to be attached on either side to these transactions, and there is every assurance of the contract business in ore being all right.

Aside from the business of the package freight boats, the boats owned by the ore companies and the boats sharing some part of ore freight contracts, there is an outlook more gloomy than at any time since the present depression set in. There is every reason to believe that ore dealers have reached the limit of their ability to move ore even at the advantageous rates of freight at which tonnage has gone begging for two or three weeks past, and the vessels already in ordinary will be joined by a big fleet within the coming ten days, as there is little hope for any revival in grain shipments.

The movement of soft coal, especially to Lake Michigan, has also shown a marked falling off, notwithstanding the shortage, and without coal to be carried up the lakes at some price it is not possible to keep the present fleet in commission. One wealthy coal concern, the Northwestern Fuel Company, has done a great deal toward upholding the movement to Lake Superior, by its ability to ship to its full capacity.

Indispensible Aids to Navigation.

One of the greatest struggles that the officers of the Lake Carriers' Association will have in the next Congress will be in the work of securing appropriations for numerous lights and fog signals that are needed in different parts of the lakes. Preparations are already being made, however, for a strong effort in this direction, and the subjects of tariff and finance will not deter the executive members of the association from uniting lake influences on a systematic plan of action. As the last Congress authorized the establishment of about forty different aids to navigation, the work this fall will be confined mainly with the light-house board and the committee on appropriations, and will not be as extensive as it was a year ago, but will be equally difficult, on account of the certainty of a policy of retrenchment in Washington. The necessity of all the lights and fog-signals authorized on the lakes will, however, be urged by the representatives of the vessel owners. At least ten items in the list of about forty authorized are absolutely indispensable, and they involve an expenditure of \$128,600. They are as follows:

Moving range lights, Maumee river, Lake Erie, so as to properly light the new channel, \$8,000.

Forty-Mile point, Lake Huron, light and fog-signal, \$25,000.

Death's Door passage, Lake Michigan, range lights and fog-signal, \$21,000.

Moving main Chequamegon light, Lake Superior, and establishing fog signal, \$7,500; harbor light and bell, Chequamegon, \$2,500.

Portage lake ship-canal, Lake Superior, fog signal, \$5,500.

Seul Choix point, Lake Michigan, fog signal, \$5,500.

South-east end of North Manitou island, Lake Michigan, light and fog signal, \$20,000.

Squaw point, Little Bay De Noquette, Lake Michigan, light, \$5,000.

Fourteen-Mile point, Lake Superior, light and fog signal, \$20,000.

Southerly end of South Bass island, Lake Erie, light to range with Green island light and Marblehead light, \$8,600.

Overwhelmed with Excursionists.

WESTERN OFFICE, MARINE REVIEW,
No. 701 Phoenix Building, CHICAGO, ILL., July 27.

Out of the alleged race to Milwaukee between the Columbus and the side-wheeler City of Milwaukee, there seems to have started a fine series of complications, which will take both time and trouble to straighten out. Of course the all absorbing question is, "Who won?" That is answered in several ways. The whaleback made better time than the City of Milwaukee over the course, but how much better is given in different periods. Capt. McArthur and Engineer Blovitt of the Columbus say that they made 22½ miles on the way up, and that they made fully an hour better time than the Milwaukee. People on board the whaleback say that the difference in corrected time was only about ten minutes, and that they were very much disappointed in the result of the test. One of the humorous things connected with the affair was the assertion in a press dispatch that the Andy Johnson followed the two steamers to Milwaukee to prevent their racing. How this was to be done is not stated, but it is considered quite a joke. The Johnson left long after the Columbus, which started far in the rear of the City of Milwaukee, and it is dollars to cents that the officers of the Johnson never caught a glimpse of either steamer until they got into the river at Milwaukee. Of course the facts of the race could only come to them by hearsay.

Customs officers are asking themselves what they are on earth for. The officers of the Johnson marched up to the gangways of the three steamers at Milwaukee and took the places of customs inspectors in counting the people as they rushed aboard. When they thought they had enough on the boat they shut the gates, and the steamboat managers say that is the reason why many people were left at Milwaukee by the returning boats. That there were many left is certain, and most of them walked the streets, as they had spent their money, expecting no trouble. When the Henry syndicate gets through paying \$2.40 railroad fares where \$1 tickets were sold, it will have plans formulated for carrying bigger excursions than last Sunday's without a hitch.

D. T. Helm, the well-known vessel broker, entertained, Saturday night, a large party of friends, consisting of grain shippers and marine men principally on the new tug named after him. The Helm is one of the finest tugs going into service in general Chicago river towing for many years.

A Wreck that is Causing Trouble.

EDITOR MARINE REVIEW: Since the ice went out last spring the old scow Mt. Vernon of this city has been lying on the bottom, just above Mead street bridge. The scow is in the middle of the river, and has proven a menace to navigation, the owners not having sufficient means, so they claim, to remove it. The city received bids for removing the hulk, but after consulting among themselves the aldermen decided to reject all bids, claiming they had no authority in the matter. Can you state whose duty it is to see that the vessel is removed; and after removal can the owners claim damages? There seems to be a fine point of law here.

GEORGE D. FELLOWS.

Racine, Wis., July 22.

[The United States statutes provide "that all wrecks of vessels and other obstructions to the navigation of any port, roadstead, harbor, or navigable river, or other navigable waters of United States, which may have been permitted by the owners thereof or the parties by whom they were caused to remain to the injury of commerce and navigation for a longer period than two months, shall be subject to be broken up and removed by the secretary of war, without liability for any damage to the owners of the same." As a river and harbor act of recent date gave to the war department supervision over all navigable streams in the matter of determining harbor lines, bridge obstructions, etc., it would seem that it is the duty of the war department to remove this obstruction. Vessel men of Racine can settle the question of authority by calling upon the United States engineer in charge of the district to remove the vessel.—Ed.]

Shipping Legislation in the Next Congress.

Special Correspondence to the MARINE REVIEW.

WASHINGTON, D. C., July 27.—Congressman Fithian, of Illinois, leader of the free ship element, says he will introduce a free ship bill when Congress assembles next month, but he will probably exempt from its operations vessels in the coasting trade. He was on the committee on merchant marine in the Reed Congress and made a minority report in favor of a general free ship bill as a substitute for the subsidy law which passed that Congress. He was prompt to report such a bill again in the last Congress, and prepared reports on both occasions which went into the history of our shipping legislation and into the result of the free ship policy and the subsidy policy in different countries. He never succeeded in getting his bill to a vote in the last house, although he made repeated appeals to Speaker Crisp and the committee on rules to set a day for its consideration. There was a certain degree of opposition from New York interests to a general free ship bill, and Mr. Bourke Cockran, with his bill granting American registers to the Paris and New York, had the speaker's ear more closely than Mr. Fithian. The limitation of the new bill to vessels engaged in the foreign trade, as proposed by Representative Andrew in the last Congress is likely to disarm some of the hostility to such legislation, and the fact that the Senate is Democratic will remove the claim which the committee on rules made in the last Congress that the passage of such a bill by the House would be a mere empty demonstration. The Democratic majority in the Sen-

ate is small, and there have always been rumors when such legislation was under discussion that two or three Democratic senators would oppose it. It is held also that the feeling will prevail in both houses that the Democratic majority is committed to so much other new legislation that it will be well to postpone further antagonisms by taking no action on the subject of free ships. Democratic majority has usually shown its willingness to vote for free ships when the question was presented, but the subject is one which does not especially interest some of the members from the interior states and the feeling in favor of legislation of this kind has no such earnest character as that in favor of the revision of the tariff.

The statistician of the agricultural department has been giving attention of late to taking freight rates on grain from Chicago to Buffalo and also the Erie canal rates on grain from Buffalo to New York but the statistics are, of course, so old that they are of no practical use throughout the season, although they will be of service in legislative matters, on account of the official importance attached to them.

W. D. Andrews, who has gained considerable distinction in Canada by his works on life saving, writes Supt. Kimball of the United States life saving service, that there is now some hope of success in the movement to establish a government service in the Dominion.

Suing for Demurrage—Dominion Marine.

Special Correspondence to the MARINE REVIEW.

KINGSTON, ONT., July 27.—Messrs. Walkem & Walkem have been instructed by the owners of the steamer Sir Leonard Tilley, and consort to enter actions for demurrage against the owners of grain consigned to Kingston and delayed there many days before discharging. This is one of the results of delays to vessels here caused by the absence of an elevator. Masters and owners of American vessels are greatly surprised at the lack of enterprise in securing an elevator. Mr. Owen, manager of the Owen fleet of Chicago, who was here a few days ago says a house with a capacity of half a million bushels could be built for \$25,000. "The Montreal Transit Company is well able to build such an elevator" said Mr. Owen. "I hear the forwarding companies want the government to provide a site and build the elevator, and I suppose if the government did build it the companies would want the expense of running it defrayed out of the public purse."

In a few days there will go forward the first cargo of Canadian magnetic ore for a Pennsylvania furnace that has been handled here in three years. Ore producers here will, of course, be pleased to see the prohibitive duty on ore removed by the present administration in the United States.

The Dominion department of public works has just launched the new dredge Lavel. It is one of the largest and most powerful ever built in the Dominion. It is 152 feet keel, 30 feet 6 in. beam, 11 feet 11 inches hold, and has a well 91 feet 9 inches long by 6 feet wide. The Lavel is specially intended for deep dredging in the lower St. Lawrence.

The Montreal Witness intimates that the demand for barges for grain transportation service between Kingston and Montreal has created a panic in the coal dealers' quarters. The stocks are 40,000 tons less than at the same date last year. If the boats are not soon released for the coal trade there is danger of a hard coal famine next winter.

The United States engineer corps has chartered the steamer Stranger and crew for the purpose of making a survey of the St. Lawrence river from Ogdensburg to Cape Vincent. The engineers will locate obstructive rocks and shoals, working 500 feet from the center on either side thus making a channel 1000 feet broad. Next season the work of removing the obstructions will be commenced.

The steel steamer Mulgrave has been launched at New Glasgow, Nova Scotia. This is the first steel vessel built in the maritime provinces. The craft is 122 feet keel, 30 feet beam, and 16 feet depth. Her engines are of the compound type of about 600 horse power.

Lake Carriers' Matters.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., July 27.—The statement, made in some marine column lately, that the schooners Law and Vance would be first to take advantage of the agreement providing for reciprocity in wrecking is premature. It ought to be true, but it is not. The Canadian proclamation has been issued, but ours has not. There is supposed to be no special reason for the delay beyond the mere failure to get down to the matter, and the state department will doubtless reach it in time. Still, fall weather is not far off, so an effort will be made to get started. Secretary Keep of the Lake Carriers' Association has interested Congressman Lockwood of this district in the matter, and if nothing is done before Congress meets he will poke up Secretary Gresham.

The brief of the vessel committee on the raft question is ready and will be sent to the board of engineers in a few days. The raft people will then be given a month to prepare a brief in reply. It is then in order to prepare a bill on the subject. It is hoped that by that time one can be framed that will be fairly acceptable to all parties.

Though Buffalo is not in the company to any extent the report that the new Cleveland and Buffalo line contemplates building a fine steamer will be received with satisfaction, especially if true, as it would indicate that the company is prospering in an off year and ought to become a permanent institution.

Steel Ship Construction.—Part V.

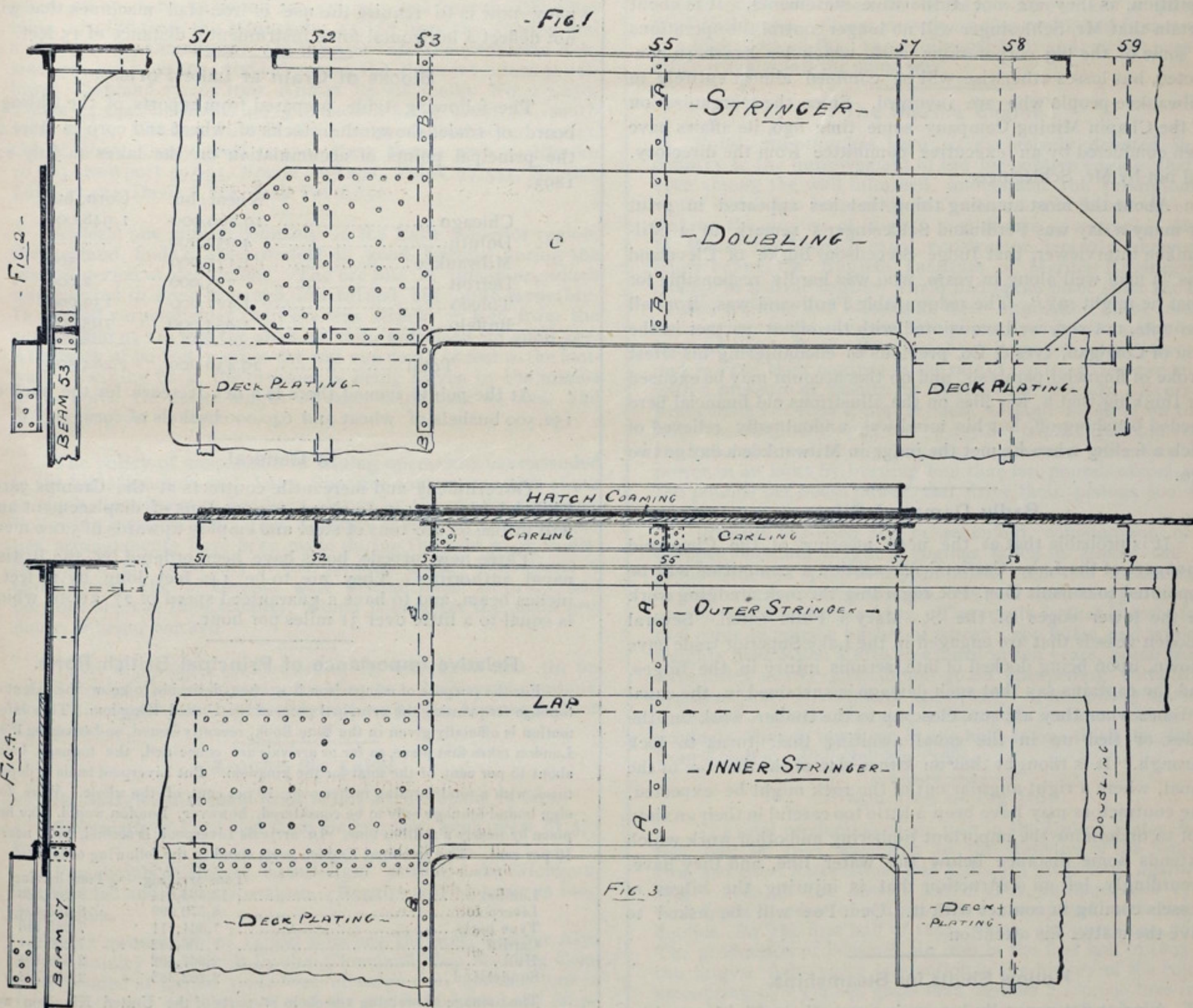
STRENGTH AT CARGO HATCHES.

It will be observed, by reference to the preceding article that by cutting a hole in the deck for a cargo hatch the area of the deck plating in the ship under consideration is diminished, 67 inches. The unavoidable weakest section governs the construction of the vessel, for no part should be weaker than this section. It is necessary that compensation be made for this weakness and the vessel made as strong at an opening as at the line of rivet holes across a beam. Fig. 1 illustrates how this strength may be retained without increasing the strength between the openings, and keeping the vessel similar in area throughout. At AA, Fig. 1, the rivet holes are spaced ten diameters apart, center to center, thus reducing the number of rivet holes at this section to seven instead of eleven at the unavoidable weakest section. The stringer plate, coaming and

inch rivets necessary to fasten the doubling to stringer plate before and abaft the hatch openings, the doubling plate forming a butt strap at the line of the rivet holes through BB. The doubling plate C is continued for two beam spaces beyond the hatch hole and seventy-three rivets are put in, that number being the amount necessary to resist a strain tending to fracture the vessel through BB.

BB, Fig. 1, is a weak part noticeable in lake vessels. The hatch coaming and carling at AA have a strength of 225 tons. At BB the hatch coaming is continued around the opening, so as to get five rivets through the beam and five in the butt strap, equaling 84 tons. There are four rivets connecting the end of the carling to the beam, which are equal to 40 tons, or 124 tons in all. This section is, accordingly, 101 tons weaker than the section AA for each side of the vessel.

When stringer plates are 60 inches wide they should be



carling minus the rivet holes has an area of 34.875 square inches, leaving a weakness of 24.375 square inches for each side of the vessel. C in Fig. 1 is a doubling plate, 36 inches wide by $\frac{3}{4}$ -inch thick, having an area, minus the rivet holes, of 24.75 square inches, which is equal to the lost area for one side of the vessel.

The number and size of rivets connecting the doubling plate to the stringer plate beyond BB is of considerable importance, as it is possible for the stringer plate to give way at the line of rivet holes through BB when the ship is under tension. Let us suppose that a fracture occurs at BB by the stringer plate breaking and shearing in the end of the coaming, through the beam and butt-strap; also pulling rivets out of beam 53, Fig. 2, at the end of the carling. There would be a strength of 945.25 tons, or 831.25 tons weaker than at unavoidable weakest section. By dividing 831.25 by 11.5 we will arrive at the number of $\frac{7}{8}$ -

fitted in two plates, and then there would not be so much depending upon the rivets. If the plates were lapped the area of the section would be increased by the width of the lap.

Fig. 3 is the plan of stringer in two plates. At AA the section is 30 tons stronger than in Fig. 1. At BB the doubling plate and stringer plate are continued inside the line of the hatch, so as to give more area and be equal in strength to AA. Should the stringers be fitted edge and edge and strips fitted between the beams, there would be no additional strength, but if the strips were continuous the strength would be greater than the lap, there being metal equal to two-laps.

It has been claimed that "a vessel with considerable sheer has no assistance from the deck plating in resisting tension or compression." It appears likely enough that under compression the deck would bend until it closed both ends, but unde

tension the deck would oppose the strain whenever it came to a straight line. The deck plating is of considerable importance in checking a twisting strain. There is a tendency in vessels' hatches to change form. In a case noted recently, two vessels, one with a sheer and the other with a straight deck, were fractured, and the former more so than the latter, showing that the sheer is of no consideration when a vessel is under tension. Various methods could be introduced in upholding lost area, but it is most important to resist twisting and the best practice is to double the stringer in some way.

The Schlesinger Failure.

Rumors about the failures precipitated by Ferdinand Schlesinger have caused considerable interest in iron mining and vessel circles during the past few days, but none of them will bear repetition, as they are not authoritative statements. It is about certain that Mr. Schlesinger will no longer control the operations of some of the big corporations with which he has been connected, but losses otherwise will be confined almost entirely to Milwaukee people who are involved. Since the reorganization of the Chapin Mining Company some time ago, its affairs have been conducted by an executive committee from the directory, and not by Mr. Schlesinger.

About the most amusing thing that has appeared in print for many a day was Ferdinand Schlesinger's remark to a Milwaukee interviewer, that Judge Stevenson Burke of Cleveland was "a man well along in years, who was hardly responsible for what he might say." The redoubtable Ferdinand was, from all accounts, not very well acquainted with the silent partner in the firm of Corrigan, Ives & Co. previous to encountering his latest stroke of financial paralysis, and on this account may be excused for thinking that a few flies on the illustrious old financial hero needed brushing off, but his mind was undoubtedly relieved of such a feeling when he met the judge in Milwaukee a day or two ago.

Badly Damaged Bilges.

It is probable that at the next meeting of the Cleveland managers of the Lake Carriers' Association a committee will be appointed to consult Gen. Poe regarding the rock dredging work on the lower edges of the St. Mary's Falls canal. Several wooden vessels that are engaged in the Lake Superior trade have shown, upon being docked of late, serious injury in the bilges, and the captains say that such damage is sustained in the canal at times when they are run close up to the timber work on the sides, or tied up in the canal awaiting their turns to lock through. It is thought that on either side of the bottom of the canal, where a right-angular cut of the rock might be expected, the contractors may have been a little too careful in their anxiety not to undermine the important timbering and other work which extends some distance below the water line, and they have, accordingly, left an obstruction that is injuring the bilges of vessels coming in contact with it. Gen. Poe will be asked to give the matter his attention.

Hollow Shafts for Steamships.

A point not generally known in connection with the machinery of modern steamships is that all the shafting is hollow. After the shafts have been forged solid, a core, sometimes 6 or 8 inches in diameter, is bored out from the center, leaving a safe amount of metal in annular form for the work required. The reason for this is that a hollow shaft is really stronger as well as lighter than a solid one, and also that the core of a solid shaft often embodies impurities and incipient cracks which may radiate to the surface after long use and cause disaster. The same idea of hollowing out is carried through the entire system, even the crank pins being bored. The rule is now for 8 to 10 horse power to each ton of machinery, including boilers and all appurtenances.—American Shipbuilder.

Effect of Dynamos on Ships' Compasses.

Shipping authorities in England are discussing the advisability of formulating rules to govern the location of dynamos aboard vessels, on account of their effect on compasses. Mr. Frank E. Fisher of the Fisher Electric Company of Detroit, a concern that has installed most of the lighting plants on lake vessels, says that no difficulty in this regard is encountered on the lakes, as the engines and dynamos are usually placed in the engine room, which is in nearly all cases located aft in lake vessels and is full 250 feet from the compasses. This distance is more than enough to overcome magnetic effect. On war ships, however, the dynamos are usually placed forward and in some instances almost directly under the pilot house, where, of course, they will effect compasses. The practice in the United States navy now is to require the use of iron-clad machines that will not deflect a horizontal force instrument a distance of 15 feet.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on July 22, 1893:

	Wheat, bu.	Corn, bu.
Chicago.....	19,269,000	1,948,000
Duluth.....	4,932,000	.....
Milwaukee.....	1,175,000	500
Detroit.....	773,000	2,000
Toledo.....	1,427,000	139,000
Buffalo.....	1,854,000	195,000
Total.....	29,430,000	2,284,500

At the points named there is a net decrease for the week of 152,500 bushels of wheat and 640,000 bushels of corn.

In General.

Government and mercantile contracts at the Cramps yard, Philadelphia, aggregate about 125,000 tons of displacement and will utilize 90,000 tons of steel and employ upwards of 5,000 men.

Three new torpedo boats have been ordered by the British naval authorities. They are to be 140 feet long by 14 feet 6 inches beam, and to have a guaranteed speed of 27 knots, which is equal to a little over 31 miles per hour.

Relative Importance of Principal British Ports.

For the purpose of comparison it is often desirable to know the extent of tonnage frequenting the principal ports of the United Kingdom. This information is officially given in the Blue Book, recently issued, and covering 1892. London takes first place, so far as arrivals are concerned, the tonnage being about 15 per cent. of the total for the kingdom. But Liverpool leads in departures, with a total forming rather over 10 per cent. of the whole. Were foreign bound tonnage only to be considered, however, London would take first place by nearly a million tons. In arrivals Liverpool is second, with nearly 10 per cent. The principal English ports stand in the following order:

	Tons arriving.	Tons leaving.
London.....	13,564,644	8,205,326
Liverpool.....	8,570,099	8,415,424
Tyne ports.....	7,361,711	7,385,116
Cardiff.....	7,106,182	7,290,264
Hull.....	2,667,392	2,638,194
Sunderland.....	2,102,365	2,058,798

The tonnage of arriving vessels in all parts of the United Kingdom was 67,125,000 tons and that of departing vessels 61,750,000 tons.

A New Sensation on the Atlantic.

Fairplay of London has several times of late referred to excessive vibration in the big Cunard liner *Campania*, and in its last issue prints the following under the heading "A New Sensation on the Atlantic:"

Oh, what is this sensation which fairly licks creation; is this a switchback railway *a-la-mer*? If this be an illustration of what is called vibration, then something else in future I'll prefer.

You sit down to a collation, and make quite a demonstration by your efforts to dispose of it you know; you suppress an exclamation as you wonder what relation there can be betwixt your palate and your toe.

In all structural formations there must needs be limitations, in spite of all professors have to say; but if such transformations are all caused by vibrations, then I fear that some one's just a bit astray.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company.....	\$100 00	\$.....	\$.....
Champion Iron Company.....	25 00	.....	.....
Chandler Iron Company.....	25 00	.....	39 50
Jackson Iron Company.....	25 00	.....	75 00
Lake Superior Iron Company.....	25 00	.....	.....
Minnesota Iron Company.....	100 00	.....	60 00
Pittsburgh & Lake Angeline Iron Co.....	25 00	.....	125 00
Republic Iron Company.....	25 00	.....	9 25
Ashland	25 00	.....	.....
Section Thirty-three.....	25 00	.....	.....
Brotherton.....	25 00	.....	2 50
Iron Belt.....	25 00	.....	2 50
Aurora.....	25 00	.....	7 00

On the 19th inst. shipments of ore from Two Harbors aggregated 406,191 tons, of which 206,336 tons was from the Chandler mine, 175,186 from the Minnesota, 15,787 from the Canton and 8,782 from the Cincinnati. On the 15th inst. the total from Ashland was 543,840 tons, divided among the different mines as follows: Ashland 26,465 tons, Aurora 85,808. Colby No. 2 7,070, Tilden 54,544, Germania 4,975, Iron Belt 5,833, Montreal, south vein, 1,347, Montreal, north vein, 19,777, Brotherton 14,643, Comet 5,035, Carey, west 24,439, East Norrie 28,203, Eureka 16,623, Newport 39,653, Norrie 106,492, Pabst 77,541, Sunday Lake 17,524, Davis 6,204, Jack Pot 1,651.

At least one mining company in the Lake Superior region, the Ashland, finds a little comfort in good fortune during the present period of depression. The ore find at this mine, which was referred to some time ago, has turned out quite favorably. In a small perpendicular shaft ore was struck 20 feet from the surface and at 114 feet the shaft is still bottomed in good ore. At a depth of 90 feet, a cross-cut was run south 55 feet to the foot-wall. Turning back, the crosscut is being driven by the miners to the north, the entire length of same being over 80 feet, and no hanging yet in sight.

The policy of suspension in mining operations has extended to the big Minnesota and Lake Superior companies with about as much earnestness as has been shown by the smaller concerns. Following a general reduction in wages at both of these properties, arrangements have been made during the past week to discontinue a very large part of the mining work. Operations in two shafts at the Minnesota were discontinued Saturday, and only one shaft at the Chandler, which is however the main producer, is being worked.

There is probably no foundation for the rumor that the so-called Rockefeller interests in the Missabe—the Merritt combination—is arranging for a consolidation with the Minnesota Iron Company.

Around the Lakes.

St. Mary's Falls canal draft is but a trifle below 15 feet.

Shipments of hard coal from Buffalo last week were 61,573 tons.

Fog-signals at Beaver island light station, Lake Michigan, are disabled and not in operation. Repairs will be made as soon as possible.

On a mean draft of 14 feet 8 inches, the steel steamer Alva of the Bradley fleet, built by the Cleveland Ship Building Company, loaded at Lorain 3,052 tons of cargo coal and 200 tons of fuel. This was her first load and she was bound for Lake Superior.

Treasurer George P. McKay of the Lake Carriers' Association has received assurance from William Smith, deputy minister of marine in Canada, that a light will in ordinary weather be kept on the schooner Vance, sunk near the "Dummy," Lake Erie.

The American three-masted schooner Grace G. Bennett, British three-masted schooner Cavalier and British schooner Melbourne, were classed last week by the American Shipmasters' Association of New York, publishers of the Record of American and Foreign Shipping.

One day last week Mark Hopkins, with a few friends, took a spin on his steam yacht Bonita up to Bay City to have a look at the big steamer he and others are having built there. The

run from St. Clair to Bay City was made in the remarkably fast time of ten and three-quarter hours, and the return in ten and one-quarter hours. As the distance is 169 miles, the yacht's speed was fifteen and three-quarters miles an hour going up and sixteen and one-half returning.—Free Press.

Hawgood & Avery's big steamer S. S. Curry will leave Toledo during the latter part of the present week with a big cargo of soft coal. It is expected that she will load about 3,600 tons, and if she does all records in the coal carrying line, on the limited draft that will be allowed her will have been badly broken.

New rules and regulations just issued by Major J. F. Gregory, corps of engineers, U. S. A., for the government of the Sturgeon bay ship canal are more stringent than those of the canal company ever were. Craft of any kind are not permitted to lie in the cut on account of the stress of weather, but must pass through and come into the bay, where there is plenty of good anchorage. Steam vessels are also prohibited from running at a higher speed than three miles per hour and can not pass each other when going the same way.

The Marine Engine.

Public attention has been so exclusively devoted in this country to the improvement of the locomotive engine that few, even among the well informed, understand the prodigious advance which has been made in a generation in the marine engine. Taking the engines of English men-of-war as examples, Mr. W. H. White, the English naval constructor, recently showed in a paper before the English Institute of Marine Engineers the change in marine engines which had taken place since the Black Prince, Achilles and Minotaurs were engined. These ironclads had engines which weighed 400 pounds per horse power, burned five and one-half pounds of coal per hour per horse power, and worked their engines at the rate of 350 to 450 feet per minute, with a pressure of twenty to twenty-five pounds. Every five years since has seen a change, and, without dwelling on the details, the English ship of war to-day has triple expansion vertical engines, which carry 135 pounds of pressure, give one horse power in an hour by burning less than two pounds of coal, weigh 200 pounds per horse power, and drive their pistons 900 feet a minute.

Pressure has risen six or sevenfold, consumption of coal dropped one-half, weight of engines fallen in almost the same proportion, and speed nearly doubled. All this means lighter engines and more freight room, less coal and cheaper carriage, greater speed and more trips. The result is that it costs from 3 to 6 cents to carry a bushel of wheat 3,000 miles, and while rail freights have fallen a fifth to a third in ten years, ocean freights have fallen nearly one-half and go on cheapening without any apparent limit. All places are equally accessible by water and India and Australia compete in European markets with our own products, though our coast is one-half to one-third the distance from London.—Philadelphia Press.

Production of Pig Iron.

The total production of pig iron in the United States in the first half of 1893 according to the statistics of the American Iron and Steel Association, was 4,562,913 gross tons, against 4,387,317 tons in the second half of 1892, an increase of 175,601 tons, but a decrease of 206,765 tons as compared with the production for the first half of 1892, which amounted to 4,769,683. The production of Bessmer pig iron in the first half of 1893 was the largest half-yearly production in the history of the country, amounting to 2,374,890 gross tons, against 2,189,696 tons in the second half of 1892 and 2,254,345 tons in the first half. There was a total decrease in stocks of pig iron on the market at the close of June last as compared with the end of December, 1892, of 43,215 tons.

Alike to one of her sisterships on the lakes, the whaleback recently launched in England is named Sagamore.

Lloyds returns show that, excluding warships, 352 vessels of 609,120 tons gross were under construction in the United Kingdom at the close of the quarter ending June 30. Of these vessels, 260, measuring 515,791 tons, are steam, and 92, measuring 93,329 tons are sail. The present figures are less than those for the previous quarter by about 12,000 tons. This decrease occurs entirely in the steam tonnage, the sailing tonnage having slightly risen.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Chicago Office, Western Union Building, 706 Phoenix Building.
Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each.
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The books of the United States treasury department contain the names of 3,657 vessels, of 1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was, on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,631	763,063.32
Sailing vessels.....	1,226	319,617.61
Canal boats.....	731	75,580.50
Barges.....	69	25,321.12

Total..... 3,657 1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888.....	222	101,102.87
1889.....	225	107,080.30
1890.....	218	108,515.00
1891.....	204	111,856.45
1892.....	169	45,168.98

Total..... 1,038 473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

AT A meeting of the British Institution of Naval Architects in Cardiff, early in the present month, which was attended by Sir Nathaniel Barnaby, Sir Edward Harland, Professor J. H. Biles, Director of Naval Construction White and other distinguished leaders in British ship building, one of the principal papers under discussion was prepared by Dr. Elgar, who made a comparison between the Campania and the Great Eastern. One feature of this comparison had reference to shell plating. The shell plates of the earlier ship were only 10 feet long and 2 feet 9 inches wide, and were, of course, of iron, weighing 7½ cwt. The steel shell plates of the Campania were 26 feet long, 5 feet 3 inches in breadth, and weighed 45 cwt. each. Not only were rolling mills totally unable to produce such plates in the day the Great Eastern was built, but the ship yard plant did not exist for dealing with them even if they had been available. During the course of the discussion, Sir Edward Harland suggested that he would be pleased to see the Campania compared with the New York, Paris, Majestic or Teutonic, and now it is expected in English ship building circles that he will follow up the suggestion by giving such details as may be required regarding the Majestic and Teutonic.

A CORRESPONDENT in one of the English shipping journals hits the nail on the head in discussing one bad feature of the premium system here for excess of speed in war ships. "The fact is," he says, "the premium business is merely a scheme to pull the wool over the eyes of politicians, who would otherwise talk about extravagance in ship construction. The speed asked for is always figured by the navy department so well within the probabilities of the vessel, as set forth in the specifications and designs of the department, that none but a most careless builder could fail to exceed the speed called for. Contractors recognize this by a study of the plans, and are consequently able to bid at

bottom prices, counting upon the premium as certain profit, while those who cry for economy have no chance to growl." In the farcical practices attending trial trips and in many ways other than those mentioned the premium system is open to severe criticism.

ENGLISH journals are giving up considerable space to whalebacks and vessels of the turret type since one of McDougall's style of freight vessels was launched on the other side a few weeks ago. Extravagant claims are made regarding their earning qualities. It is claimed that the earnings of the steamship Turret, built by William Doxford & Sons, Sunderland, for Peterson, Tate & Co., have been for the first six months of service at the rate of 23 per cent, per annum, and that the directors of the company owning the steamer have decided to pay an interim dividend after the rate of 10 per cent. (free of income tax) and to carry the balance forward. A second steamer of this type will be launched at Sunderland within a few weeks and the company has still another boat on the stocks.

ANOTHER canal convention is to be held in New York in September. The canal interests of the Empire state have been holding such meetings for years without much in the way of a return for their efforts. If any radical improvement of the Erie canal is to be attempted it must come through the general government and not the state, which is already burthened to the extent of more than a million a year in simply caring for its present canal works.

CAPT. WM. MACK, whose vessels are trading regularly to Marquette, reports to the officers of the Lake Carriers' Association that dredges are at work on the cut to be made at "Collision Bend," St. Mary's river, and that the new channel, as staked out, will be of great convenience to navigation in that locality. The vessel owners feel grateful to Gen. Poe for the interest he has taken in this needed improvement.

IF THE present administration follows up the policy suggested by President Cleveland, when an international maritime congress was called during his last term, a department of commerce, or a national board, will be established, to take from the treasury and other departments the management of matters pertaining to shipping.

One inevitable outcome of the present business depression, especially in all branches of the iron trade, will be a general reduction in wages and a lowering of margins all around with the employer as well as the employed, and this without the disadvantages of strikes and other serious disturbances.

More Boats for Americans.

As announced some time ago, the International Navigation Company of Philadelphia is having built on the Clyde two immense freight steamers, probably the largest in the world. The contract for one of the boats was placed with W. Denny & Bros., while the Thompsons were given the second boat to build, partly for the purpose of securing whatever advantages might be had from competition. The boat being built by W. Denny & Bros. was launched a few days ago and named Southwark. She is 480 feet by 57 by 40 feet and will carry 10,000 tons, while at the same time 1,000 passengers may be accommodated. The engines are quadruple expansion, having four cylinders working four cranks. The cylinders are 25½ inches, 37 inches, 52½ inches, and 74 inches in diameter, with a stroke of 4 feet 6 inches. The working pressure is 200 pounds. These vessels will run between Philadelphia and Liverpool. They will carry a limited number of second cabin as well as steerage passengers, and the passenger departments will be so arranged that they can be utilized for freight during dull times in the passenger trade,

Loss of the Victoria.

(From Industries and Iron, London, England.)

From the unfortunate loss of such a vessel as the "Victoria" many useful lessons are to be gathered, especially by those who are accustomed to design this class of warship, but to the lay reader some further explanation is necessary to disabuse his mind of the fact that the vessels of our navy are worthless. Be this as it may, it demonstrates very fully the use and destructive power of the ram when in close quarters; but it would, in our opinion, be a difficult problem to solve as to whether one ironclad would be able to approach another to enable her to use

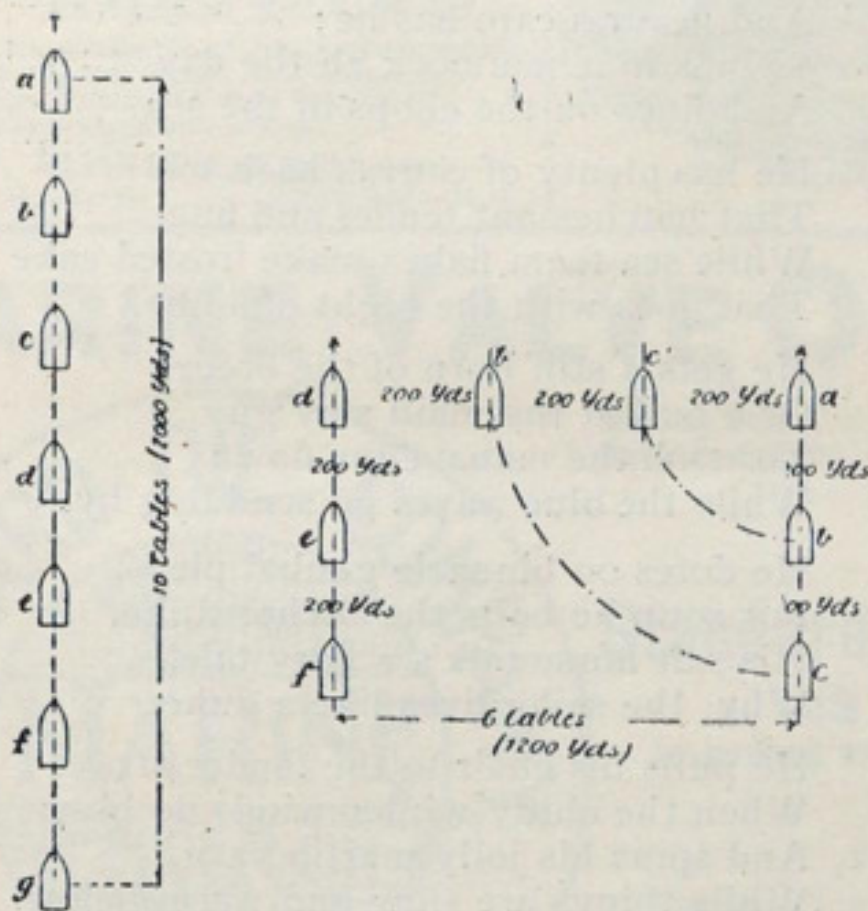


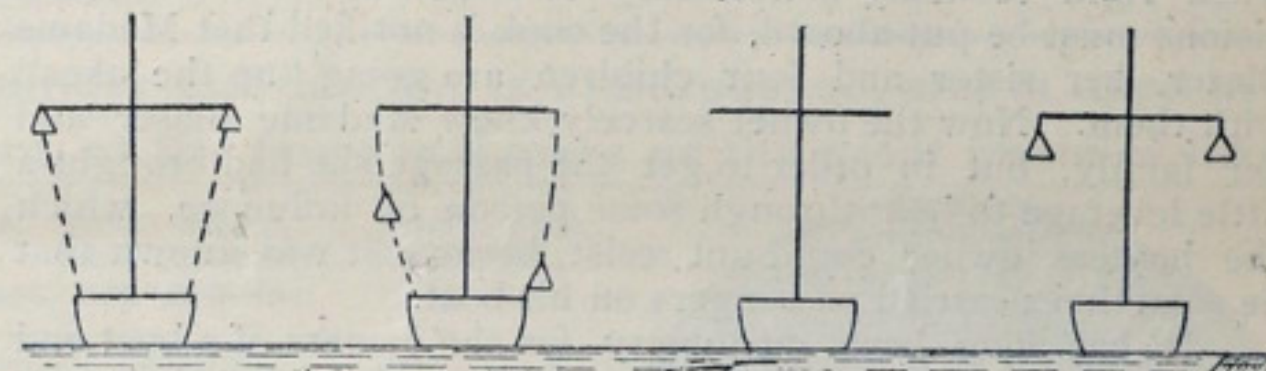
FIG. 3.—FLEET IN SINGLE COLUMN.

FIG. 4.—FLEET IN TWO COLUMNS OF DIVISIONS.

her ram, without being thoroughly smashed up by the powerful guns of her opponent. Even should she be able to get through the thick of a heavy fight, it would only be a *coup d'etat* that could be given probably to herself as well as to her foe. The telegrams and reports as to the actual manœuvre which was being performed off Tripoli have been of a conflictive nature, but taking all the information, and piecing together the salient points, it seems pretty clear that the fleet was divided into two columns or divisions, the Victoria leading the starboard column, the Camperdown the port column, and that the admiral hoisted the signals: "Starboard column turn 16 points to port;" "port column turn 16 points to starboard." It is extremely probable that we shall never know what the admiral intended to perform in this manœuvre. Did he intend to come around so that his starboard side was next the Camperdown's port side, or did he intend to exactly change columns, and so take up the same position relative to the other column that he had previously occupied, but closer to it—one of the rules of the service being that the admiral shall always lead the starboard column? This, however, is not an invariable rule, for the much-discussed gridiron movement is for the express purpose of interchanging the columns.

But before going farther it will clear up a good many points that may present themselves later in this article, and which

tween the columns at two cables apart; or a short way of putting it is—the column distance should be twice as many cables as there are ships in the longest column. Fig. 3 shows a fleet of six ships in single column, two cables between each. [A mile at sea is 2,000 yards, not 1,760.] Fig. 4 shows the same fleet in two columns or divisions, the columns being six cables or 1,200 yards apart, the dotted outlines showing the position of the ships b and c were they moved to form single column. An admiral, however, can order any distance he likes to be kept between the ships and between the columns, but the foregoing is the method generally adopted. Fig. 4 also shows the position of the Mediterranean fleet prior to the signal being given to alter their course, a process which was attended with such fatal consequences. It is thus easily seen that, the vessels being so close to each other, it is of vital importance that the intention of each ship should be clearly understood by every other ship in the



Full speed ahead. Both engines. Half speed port. slow starboard. Both ahead. Dead stopped. Full speed astern. Both engines.*
*The cones as shown are wrong way up. The apices should point vertically downwards.

FIG. 1.—STEAM-SPEED SIGNALS (STERN VIEW).

fleet—particularly at what speed they are steaming and in what direction they are steering.

For the purpose of indicating the speed of a ship to its neighbor a system of signaling by speed signals is employed. This consists in hoisting or lowering black cones upon the yard-arm, one on each side of the ship in the case of a twin-screw vessel. The cone hoisted point up indicates vessels going ahead; the cone hoisted point down indicates vessels going astern; the cone close up to the yard-arm indicates full speed; the cone half way up indicates half speed. There is also a flag always flying which shows the exact number of revolutions the propeller is making, from which the approximate speed can be ascertained. Fig. 1 will explain this very clearly. The amount of helm a ship is using is indicated by an ingenious device worked automatically by the helm, and consists of a red flag and a green ball suspended from some point well above the deck. They are connected to the same cord, which passes over a pulley above them, so that when one moves up the other moves down. When the helm is amidships the ball and flag are level. On the helm being put over either way the flag or ball rises according to which way it is put over, port or starboard. Fig. 2 shows various positions of the helm signals.

Personal Mention.

D. M. Philbin, general manager of the Duluth, Missabe & Northern Railway, announces that W. S. Brann has been appointed agent in charge of that company's ore dock at Duluth.

Commander Robley D. Evans, naval secretary of the light-house board, seems disposed to become acquainted with the needs of the lake marine in the matter of aids to navigation. He is making a tour of inspection in lake districts.

Col. Eli T. Bangs of Syracuse, N. Y., of the firm of Hughes Bros. & Bangs, builders of the new canal lock at Sault Ste. Marie, is paying a visit to the lakes, and will carry home recollections of a hearty welcome from many old friends. He is a venerable contractor and has had a hand in some very big jobs for the government.

A government official who knows Commander Nicoll Ludlow very well says, in speaking of the Alaska story about the Mohican being fired on in Behring sea: "It was, of course, a fake. The Mohican was not there at the time indicated, and if the commander had been shot at, he or the other fellow would have gone, McGinty-like, in his good clothes, to the bottom of the sea."

Mr. Anderson, constructing engineer for F. W. Wheeler & Co., West Bay City, made the trip down from the ship yard on the new Bradley line steamer George Stone, and had the thanks of the venerable vessel owner for whom the boat is named, as well as the officers of the steamer, for her fine behavior. The Stone can be classed among the best wooden steamers on the lakes,

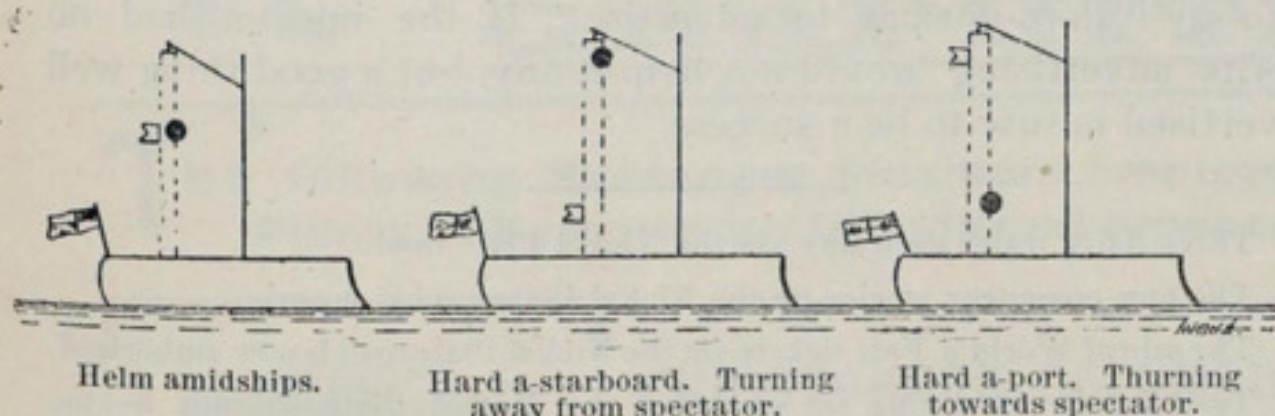


FIG. 2.—HELM SIGNALS.

would otherwise appear somewhat obscure to the non-technical reader if a general idea be given of the mode of grouping ships together in fleets, and the means employed for the express purpose of avoiding, or at least minimising, the chances of collision. Ships are usually arranged in one or more columns, the ships in each column being equidistant—generally two cables or 400 yards from each other, mainmast to mainmast. As most modern battle-ships are over 100 yards long, this only allows a margin of 300 yards from the bow of one vessel to the stern of the ship next ahead, the columns being sufficiently apart to allow space for the ships in the longest column to take up their position be-

Tips from the Man on the Dock.

An abuse of large proportions has grown up on the lakes—that of carrying passengers on freight steamers not provided with proper license from the government. Very few owners provide their boats with such license on account of the expense involved. The license fee is nothing but the extra equipment for safety required by the government, such as life-preservers, floats, etc., with possibly an extra boat, is said to cost one or two hundred dollars. Many of these unlicensed boats carry passengers during the summer season involving great risk as to their being able to escape with their lives in case of serious disaster.

There is another phase to this question. Passengers are not carried for profit but for accommodation, and the owner would gladly be rid of the seeming obligation to carry them. The boats expenses are increased. At such times as the present when rigid economy is necessary to come out even, extra provisions must be put aboard, for the cook is notified that Madame Blazer, her sister and four children are going "up the lakes" with them. Now the owner scarcely knew Madame Blazer and her family, but in order to get the passage she had brought a little leverage to bear through some person of influence, which the hapless owner could not resist, because it was known that he sometimes carried passengers on his boat.

It has long been customary for the owners of a boat and their families to avail themselves of what seems to be their undoubted right—a trip up the lakes each summer. Also to carry around, when solicited, those who are furnishing business for the boat. There would seem to be no objection to this if the craft was properly equipped with safety appliances for the number of persons on board. An advantage, in my opinion, would really accrue to the boat from bringing those most interested in her into closer contact with her, especially outside where her sea-going and other qualities could be more closely observed.

I have frequently seen on our freight steamers, the officers on watch, very much annoyed by passengers who were enjoying their free trip up the lakes. Hundreds of questions would be plied even in critical situations where the closest attention of the master was necessary to the safety of the boat. I might add that I have seen some of the gallant craft of lake captains that could not be so "annoyed," especially when the questioner was a comely young lady. Vessel masters and mates are human, quite like the rest of us, and I have known a pair of fine eyes to impress them more than the proximity of a dangerous rock or shoal.

* * *

I was going to say something to you about the after end of the boat—which, after all, like the after end of the bee, is the business end—but I have forgotten what it was. I just happen to recollect, however, a little thing that occurred a few years ago when I wasn't among the land lubbers. The skipper of our boat was one of those fellows who (like the soldier who went to war because he had a wife and loved peace) thought a good scrap was "sweeter than honey and the honey comb." On one of our trips down, we had as a passenger a Presbyterian sky pilot and his wife from a Lake Superior port. We made Ashtabula on Sunday morning early, but found our berth occupied by another steamer, which was not unloading but merely waiting till her place was clear. Our skipper was keen to get tied up, as he was figuring on a little side trip to Cleveland while the ore was going out so he tried to get the other fellow to move out of our way. The other fellow was, however, in no hurry, and several red-hot messages passed back and forth between the two boats. After a while he sprung his stern off, backed down alongside of us and asked us to take a line. But the whole crew was "in it" by this time, and instead of taking his line passed several heating remarks which brought the second mate of the other boat over the rail with a capstan bar to lay out one of our "deckies" who had made himself conspicuously obnoxious. He was met at the rail by his equal in rank, who took his capstan bar from him and threw it into the river. Of course they squared away and proceeded to adjust the difficulty. A ring was formed in no time, with our skipper,—who had smelt the battle from afar and descended from the bridge at the first sign of hostile action,—as master of ceremonies, a position which—I feel it necessary to add—he filled with great acceptability. Well, our worthy passenger, who had been an interested spectator from the chart room window, seemed to think after a while that it was incumbent upon him to earn his share of the blessing the peacemakers hold a promissory note for and appeared on deck in an effort to have the affair stopped. The ring master said, "No, let them alone" and strange to say the peacemaker withdrew,

without further effort, to the chart room window. Later on when the differences had been adjusted, the actors had shaken hands and the boat was snugly made fast, our passenger who was going on to a Pennsylvania town came around to bid us good bye. I was in my room and invited him in to take a chair. After a short conversation, which finally turned upon the events of the morning, he said; "Well, I think it was very wrong in Captain — to allow such a thing, on a Sunday morning too, but it was the best fight I have seen for a great many years."

* * *

The sailor lives a jolly life
And never a care has he;
Swings in a hammock all the day
And dines on the chops of the sea.

He has plenty of canvas back too
That hatches out tender and fine,
While sea-foam flakes make frosted cake
That goes with the bight of a line.

He gets a stiff horn of the breeze
Or a pull at the main stay guy
To wash the manavelins down
While the blue waves go scudding by.

He dotes on binnacle gimbal pie,
For soup he boils the anchor fluke,
His salt horse talk's a fairy tale,
Why, the sailor lives like a duke.

He pulls his chair to the fender strake
When the chilly winter winds do blow
And spins his jolly marlin yarn
While things are snug and warm below.

"From Mine to Furnace" is the title of a serial article descriptive of iron and coal mining, and the manufacture of coke and iron, begun in the July number of Cassier's Magazine and written by John Birkinbine, past-president of the American Institute of Mining Engineers.

There has been some talk among engineers of using centrifugal pumps for water bottom service on lake steamers. There are a number of advantages in these pumps, such as rapidity of handling and economy of space. The only objection urged is liability of breaking down, and C. R. Aldrich, 43 Builders' Exchange, Buffalo, N. Y., who has the lake agency of the best known centrifugal pump, is anxious to remove the latter objection.

The Penberthy Injector Company, Detroit, Mich., has capacity for turning out 2,000 injectors a month, and since completing additions to their factory they have put in eight new speed and monitor lathes, besides adding an engine lathe and a universal milling machine to their tool room outfit. Notwithstanding their great capacity they can not accumulate any stock but are often behind their orders. Yet there are some people who say it does not pay to advertise. If the injector had no merits advertising would not help it any, but a good thing well advertised is sure to be a success.

Three daily trains each way via the Nickel Plate road.

The new passenger service on the Nickel Plate road is superb.

The sale of World's Fair tickets via the Nickel Plate road is now authorized.

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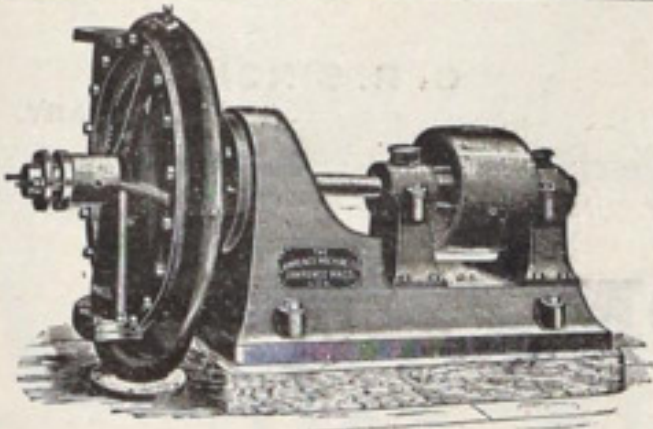
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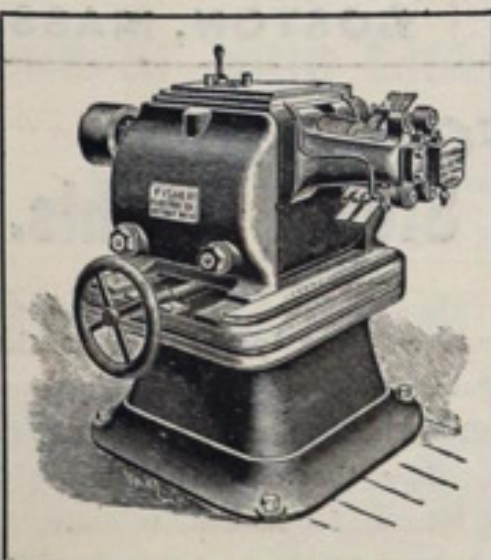
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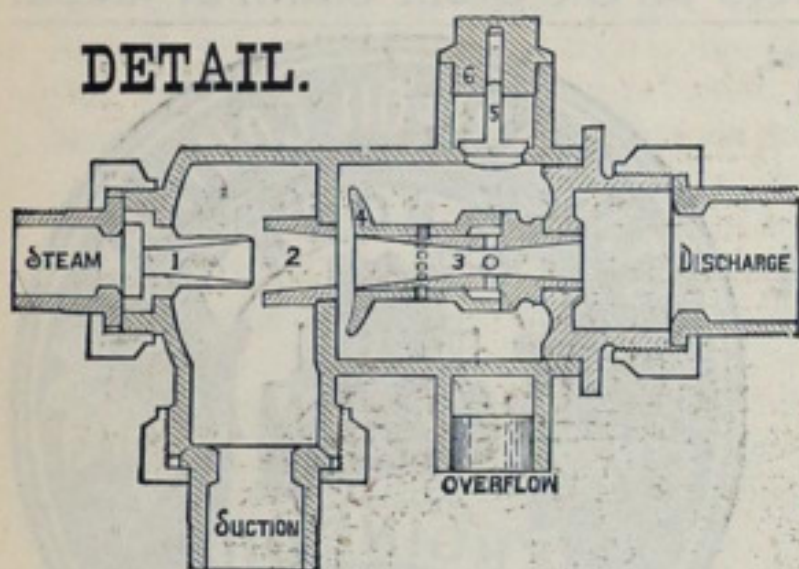
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CAPTAIN—Yes sir, what is it?

OWNER—Here is a circular explaining CRAWLEY & JOHNSTON'S "Cincinnati" Automatic Steam Steerer.

CAPTAIN—(After a careful study.) That's the best and simplest I ever saw. "It's a corker." Put one of them on my boat and I'll show you some quick work and save the price of it in a few trips.

OWNER—I'll do it, and adv'se my friends to investigate it.—Write for prices, etc.

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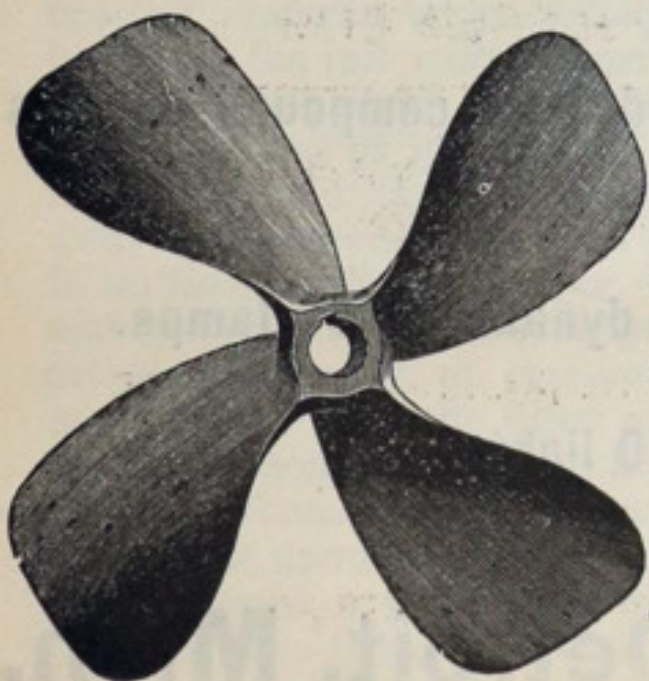
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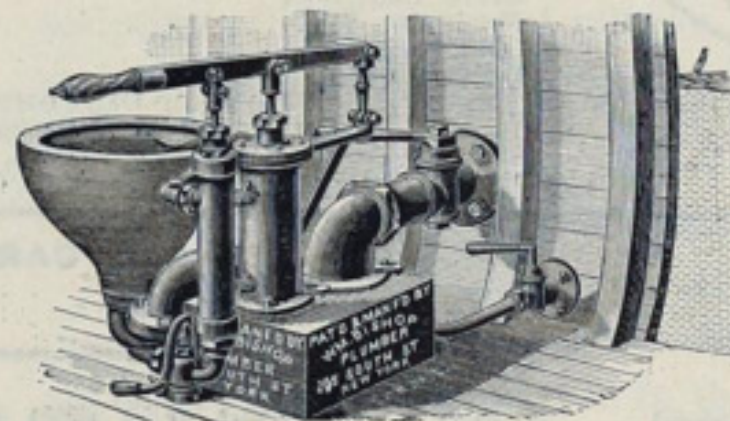
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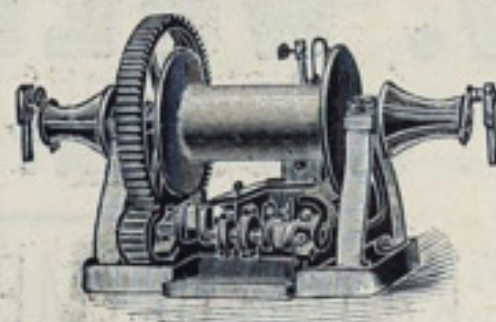
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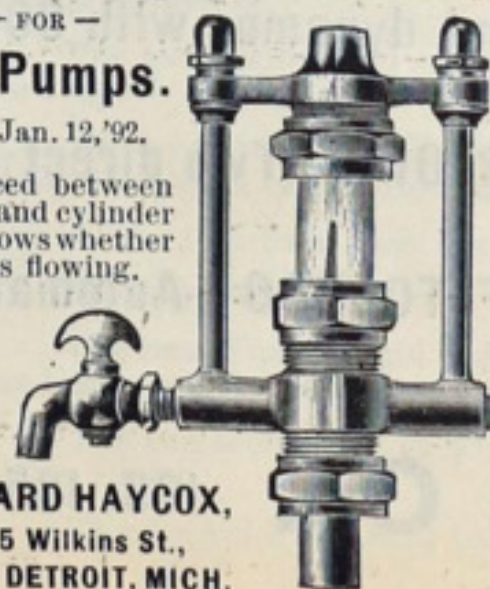
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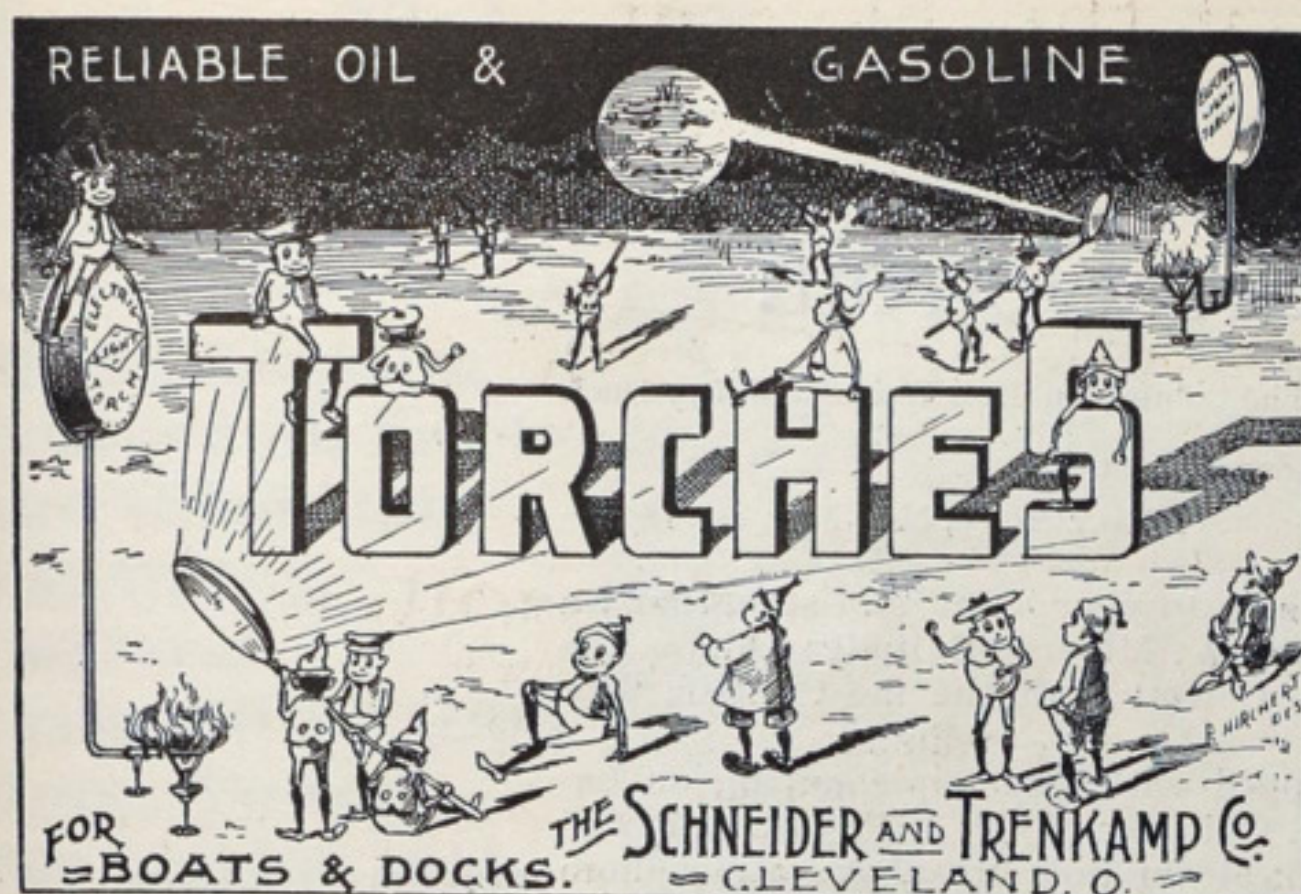


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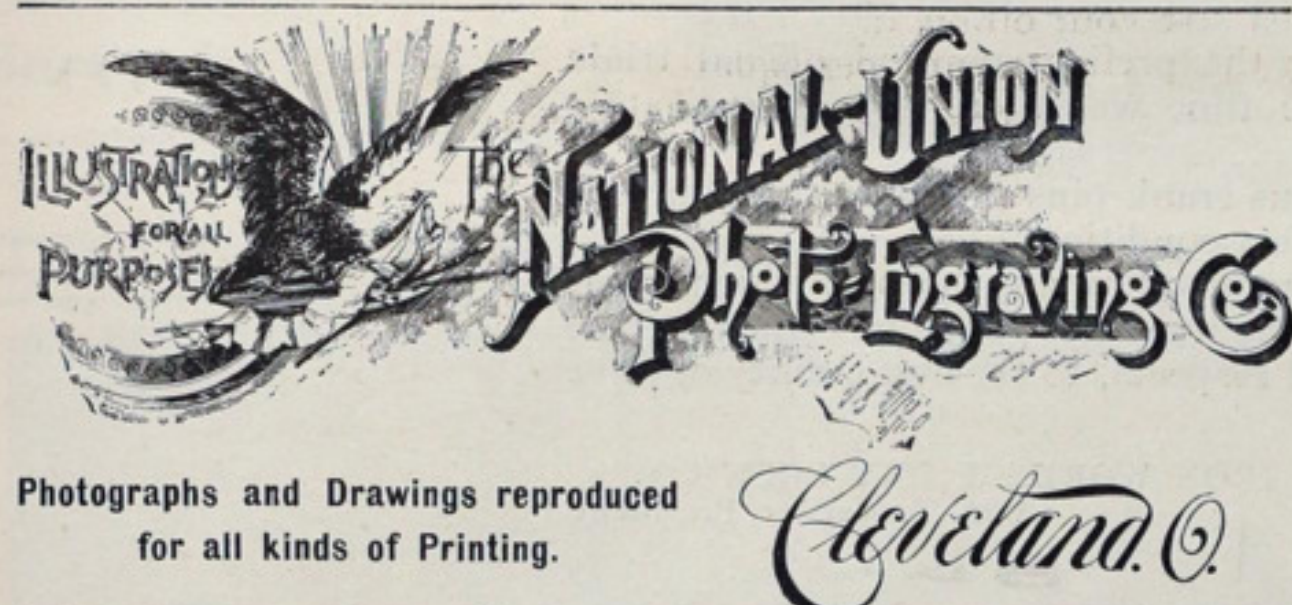


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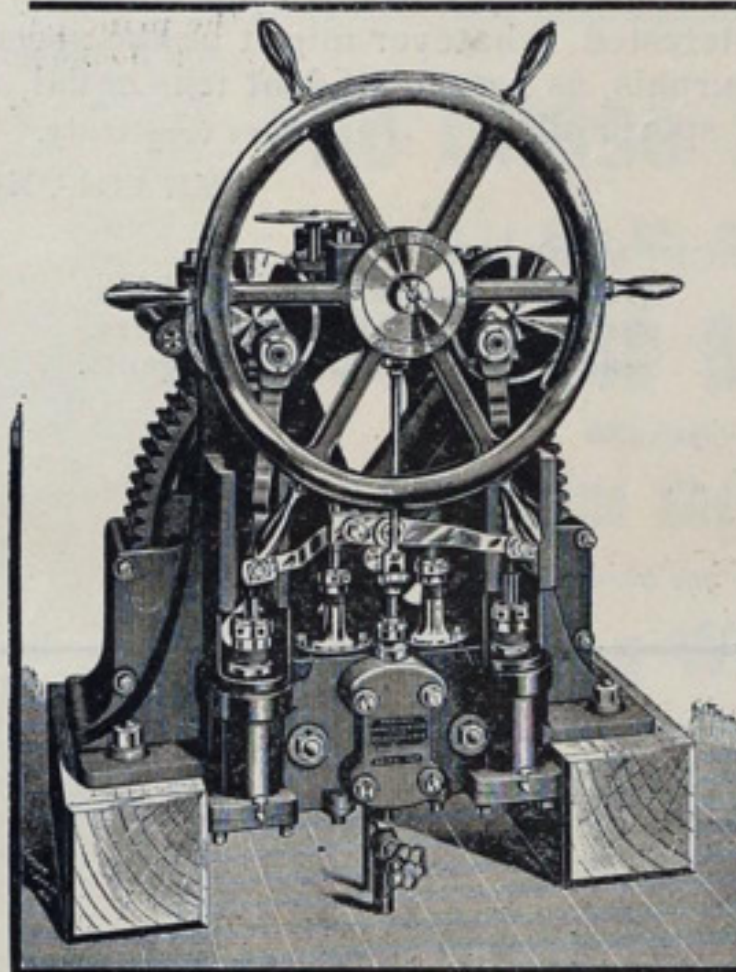
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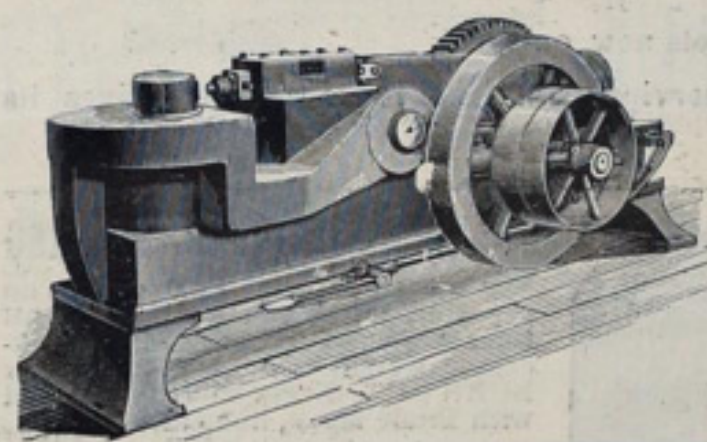
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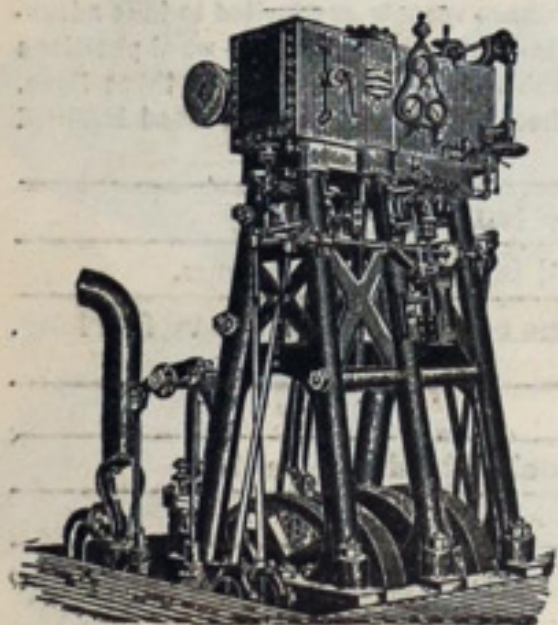
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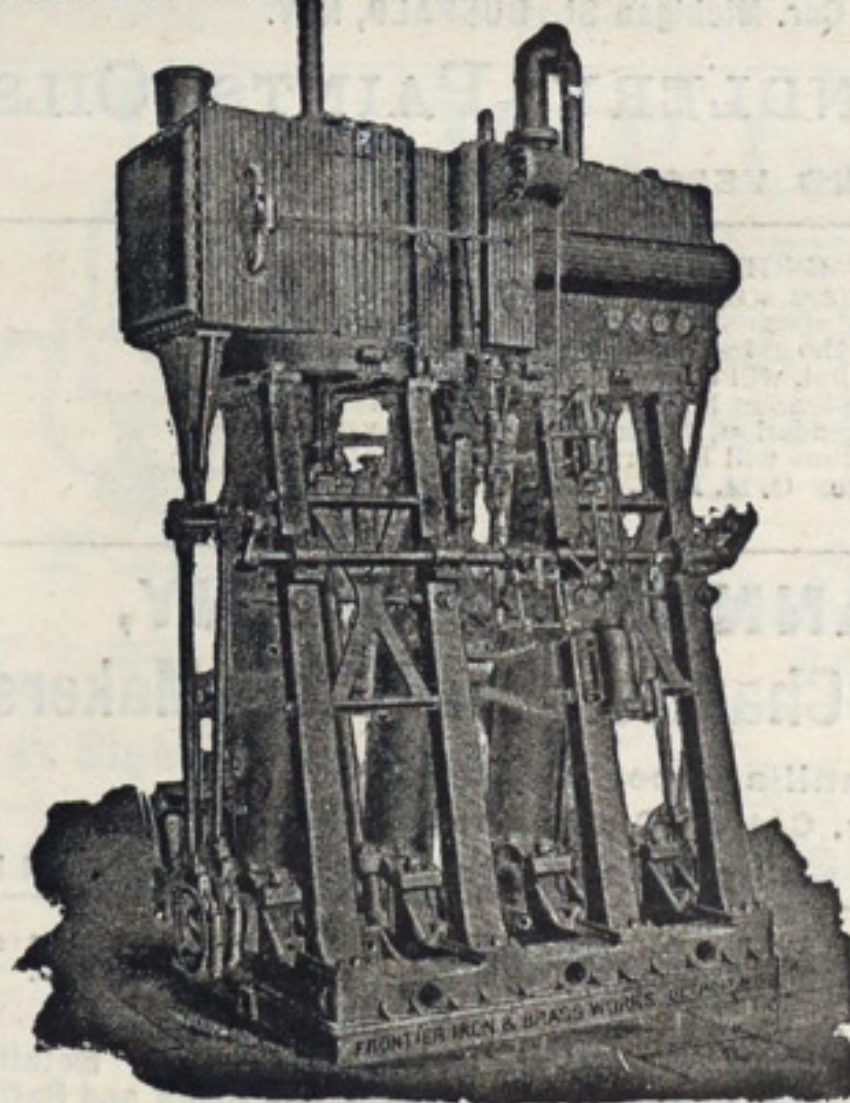
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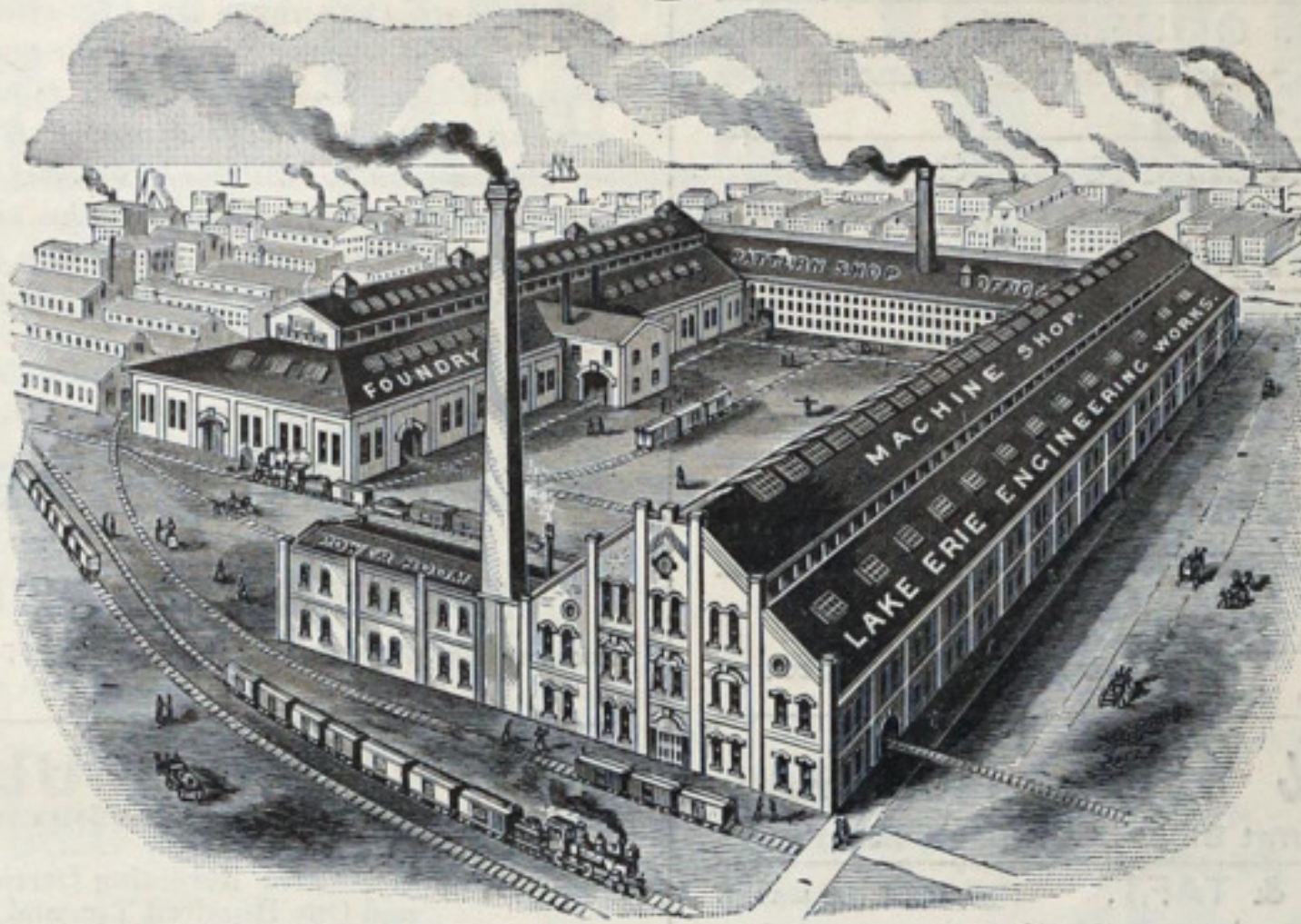
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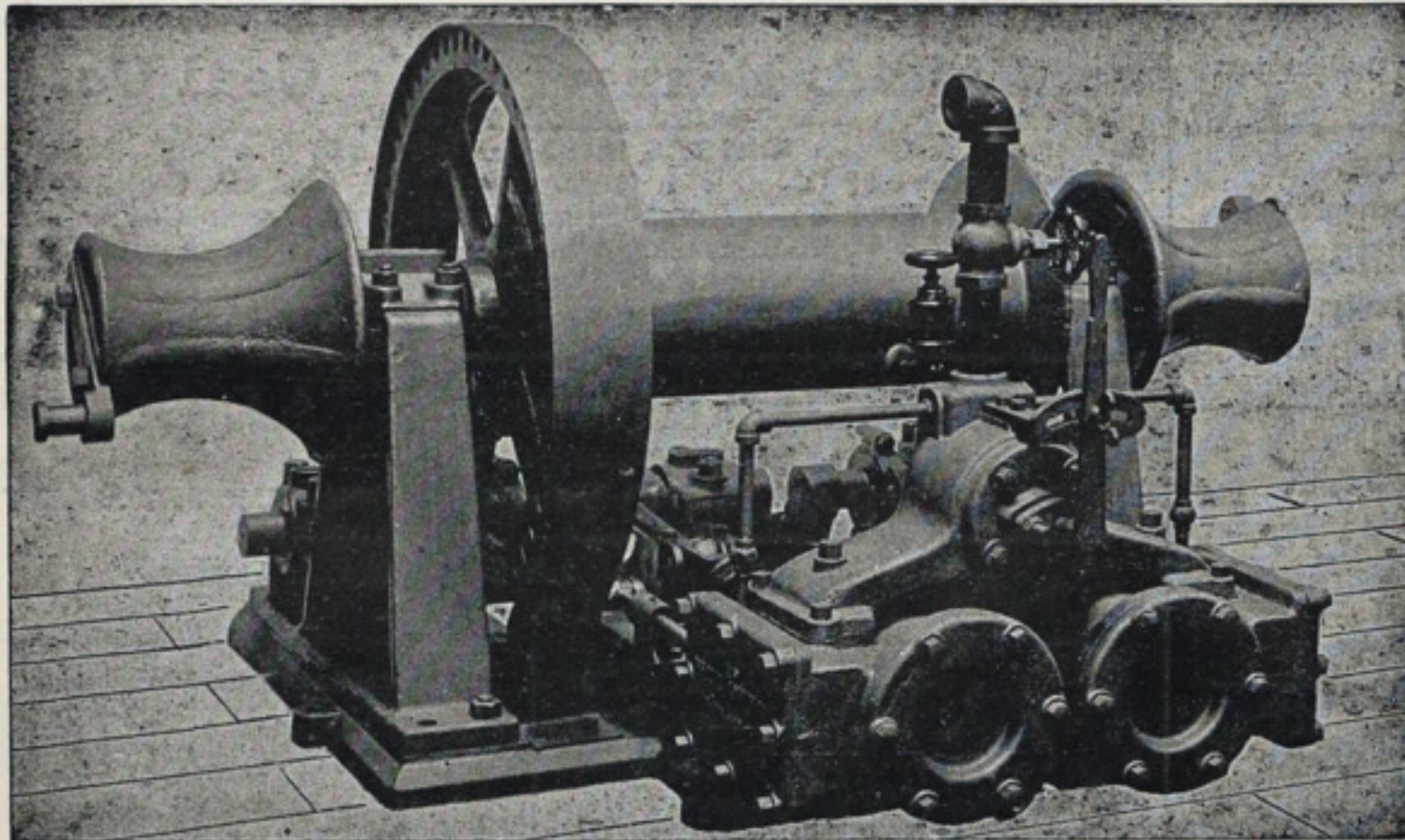
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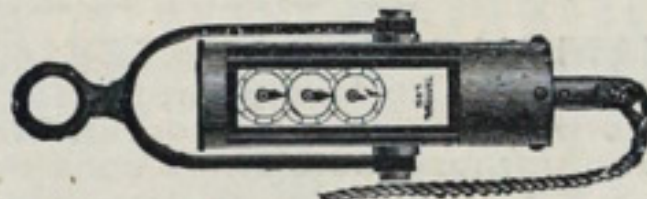
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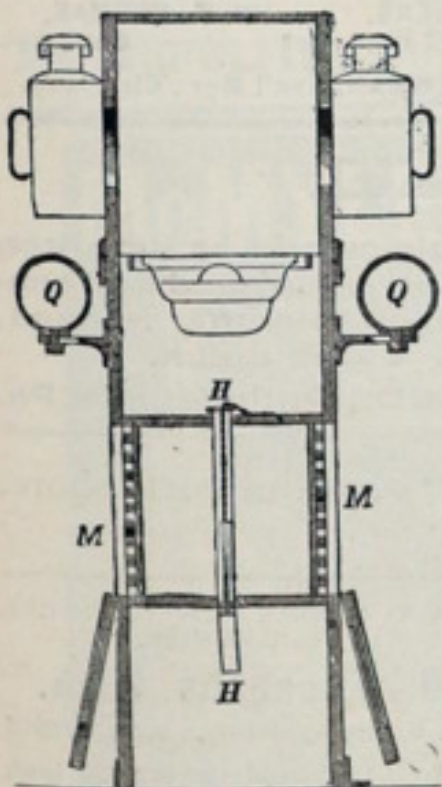
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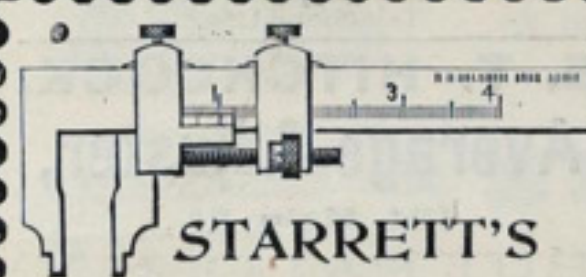
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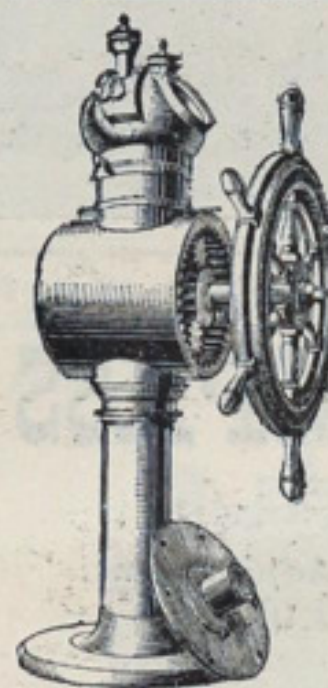
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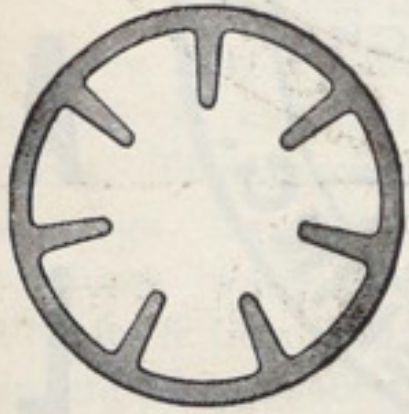
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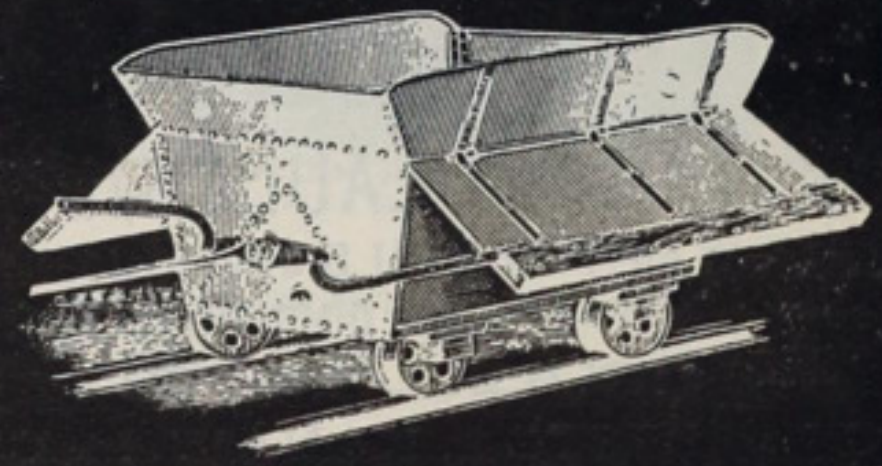
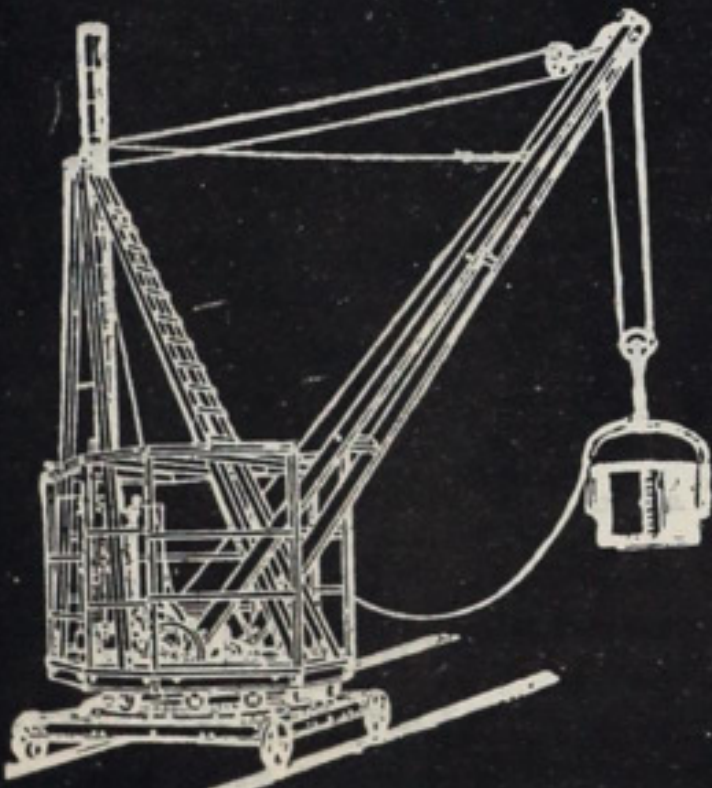
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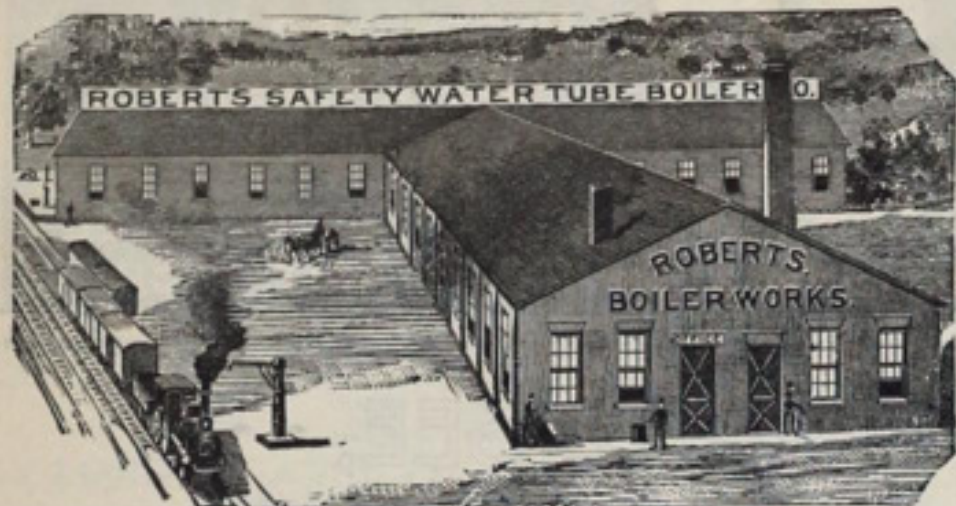
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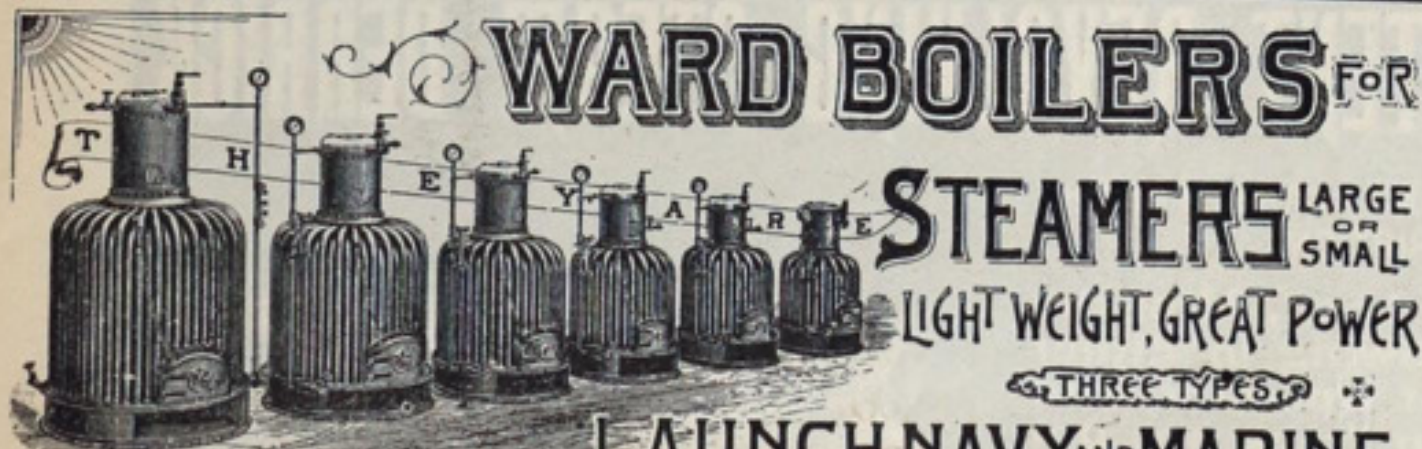
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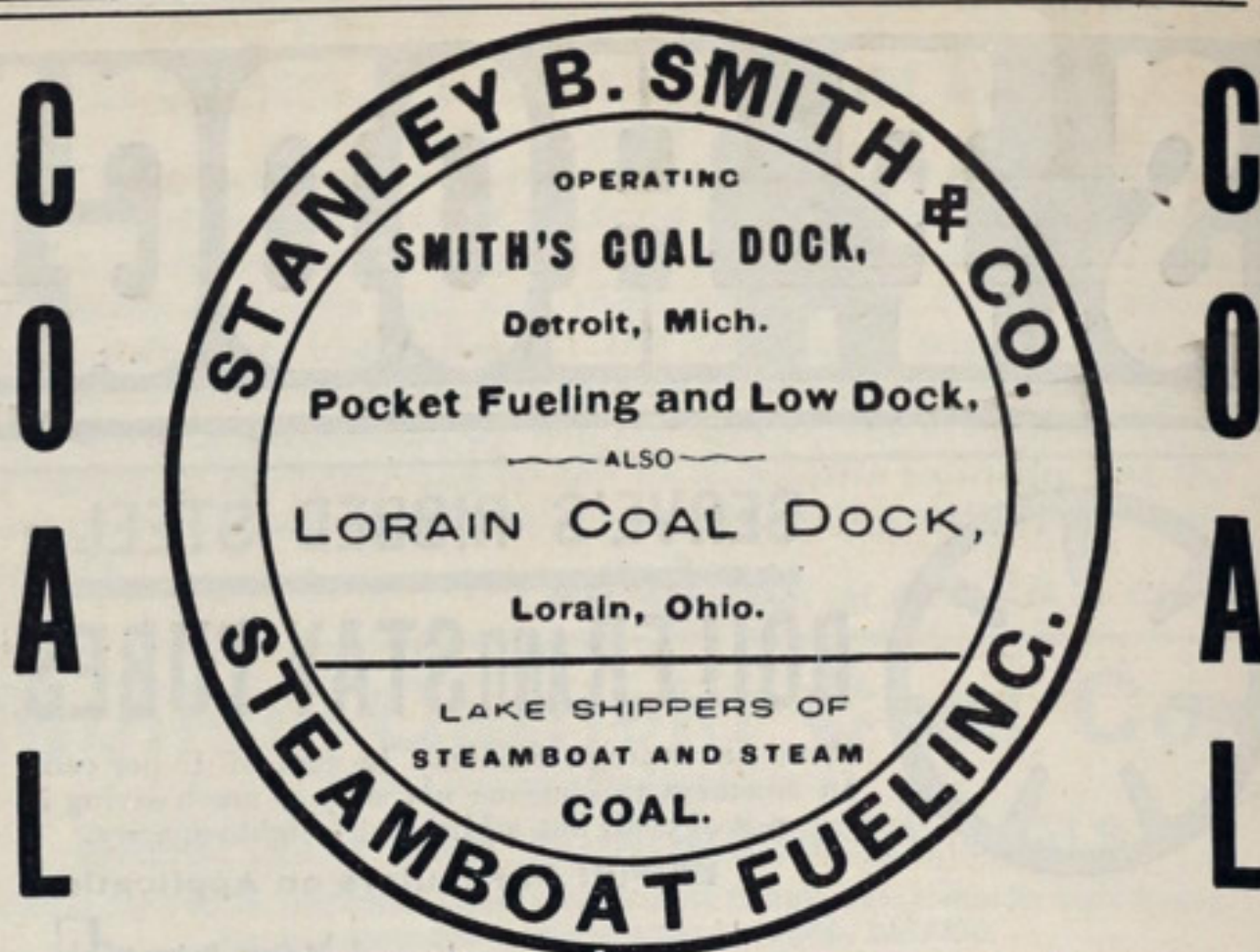
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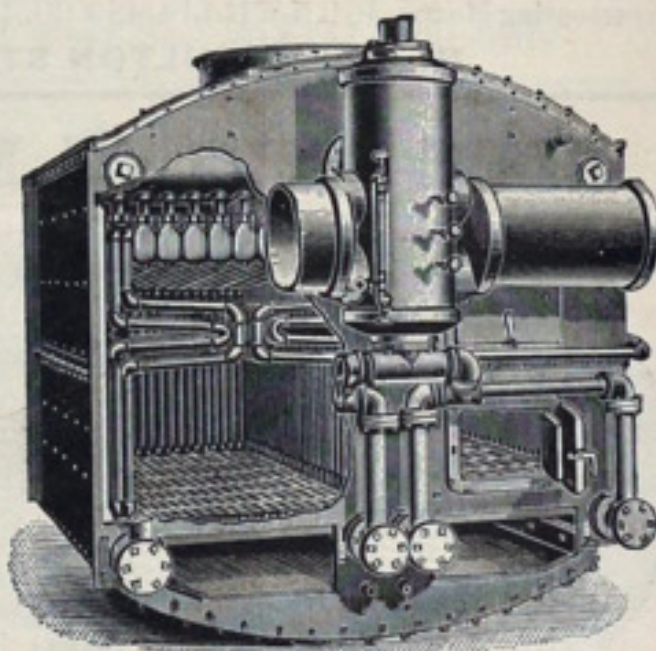
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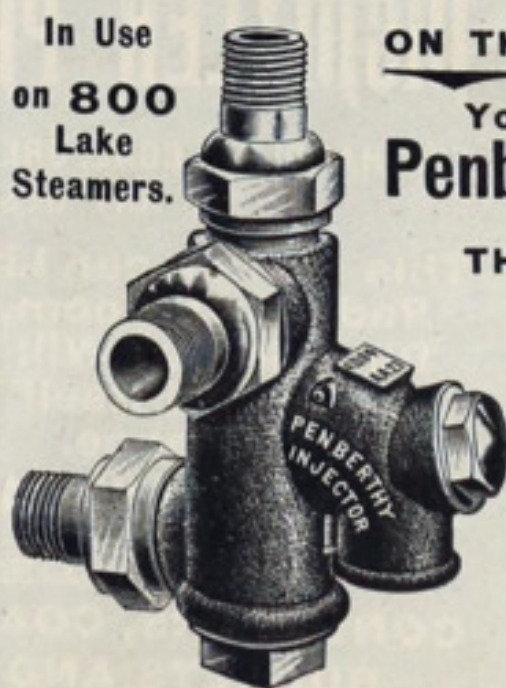
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